Earthquake Waves

Wave	P	S	L
Name?			
Wave Type? (body/surface)			
Materials travelled through?			
Relative speed?			
Order of arrival?			
Compression or shear?			
Particle Motion vs wave motion			

Name _____ Date _____

6-8 Locating the Epicenter

Introduction: An earthquake may occur anywhere along a fault line. Rocks may slip within a small area or release energy over several miles. Rock slippage extending over 150 miles occurred along the San Andreas Fault during the San Francisco earthquake.

Seismologists are scientists who study earth movement. They work in seismographic stations throughout the world. When these stations detect earth movement, they compare their records of the time and type of waves and, from that information, determine the epicenter of an earthquake.

Seismograms are the records taken on a seismograph. When an earthquake occurs, seismographic stations at different areas record the disturbance. The seismograms show both the duration and severity of the shock. Seismologists determine the location of the epicenter. If three widely separated seismograph stations report their findings, the location of the epicenter can be detected.

Objective: To show how an earthquake's epicenter can be located through seismogram records.

Materials: Earthquake maps 1, 2, and 3, compass, pencil and paper.

Procedure: Do the following:

1. Examine map 1. There are three seismograph stations—A, B, and C—and three areas marked with an X (labeled A, B, and C).
2. Begin by placing the compass point on Station A. Set the pencil point on the area marked AX. Draw an arc through the AX area. Now move the compass point to Station B, place the pencil point on the area marked BX, and draw an arc through the BX area. Do the same thing for Station C and area CX. Circle the point where all lines meet. This will be the earthquake's epicenter.
3. Repeat the procedure for map 2.

Answer these questions:

1. How may seismograph stations come in handy *prior* to a major earthquake?

_____

_____

2. How may seismograph stations benefit earthquake victims *after* the damage occurs?

_____

_____

3. Do you think seismograph stations should be located near known fault zones only? Why or why not? _____

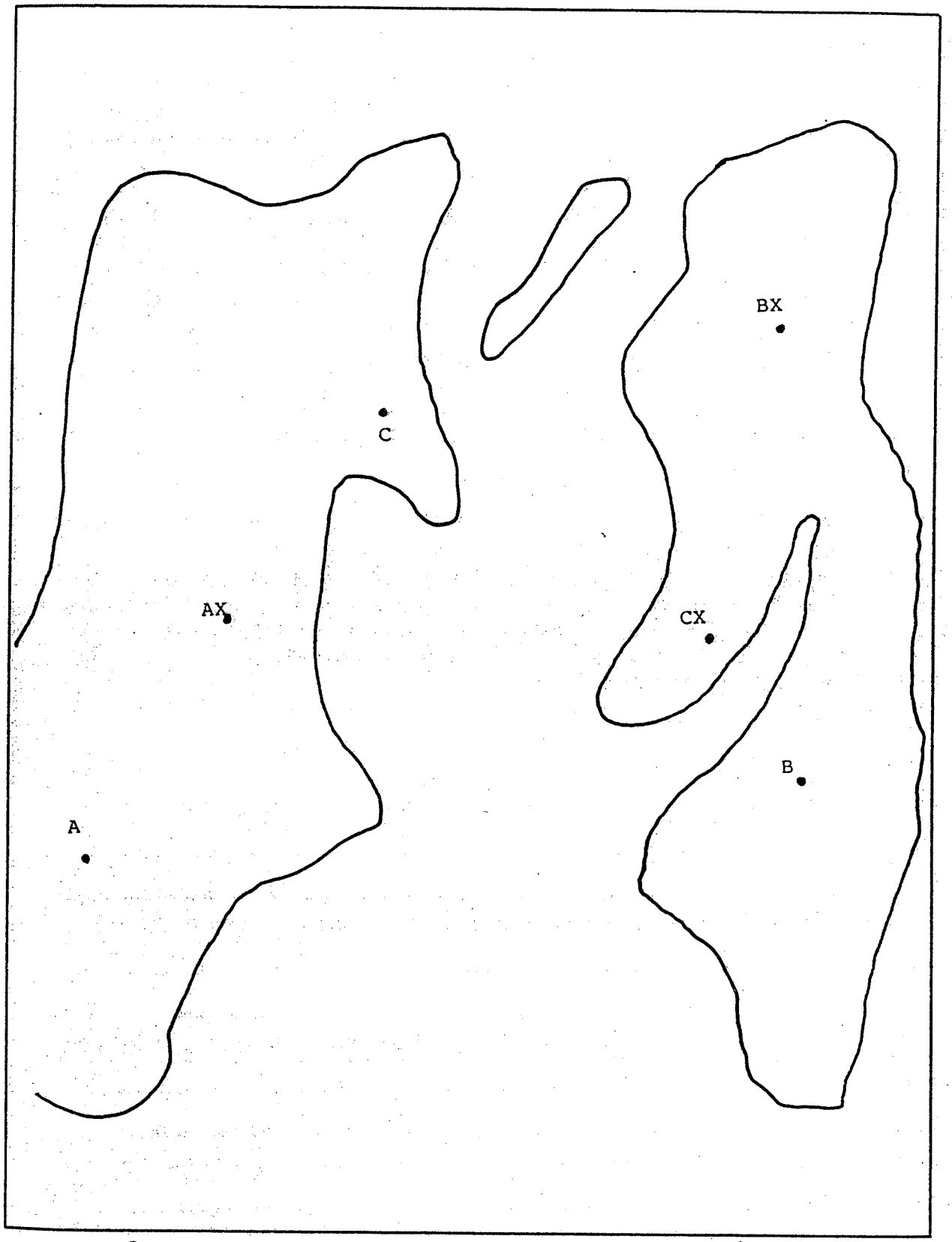
_____

4. In your opinion, where is the most unlikely place to locate a seismograph station? Why do you think so? _____

_____

5. Explain, in detail, how station A came up with the distance to AX using a seismograph.

Locating the Epicenter: Map 1



A, B & C are the stations = center of circles
AX, BX & CX are along the edge of the circles (put your pencil on the X points)

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EARTH SCIENCE 11. GEOLOGY.

EARTHQUAKES

URPOSE: To study the the distribution of earthquake focii at depth in the lithosphere..

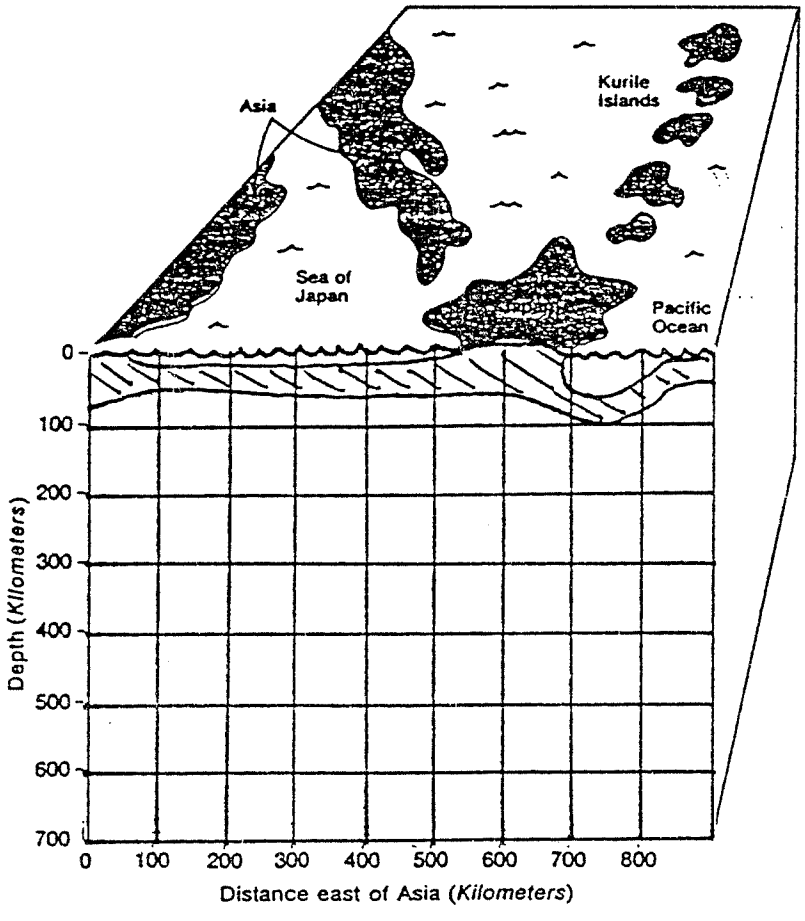
PROCEDURES:

The data below represents the location of 20 earthquake focii under Japan as measured in depth and distance east from Asia. Use a dot to indicate the location of each focus. Can the dots be joined with one line or are they in a collection rather than a line?

DATA:

Focii of Earthquakes under Japan

DEPTH (km)	DISTANCE EAST (km)	DEPTH (km)	DISTANCE EAST (km)
55	600	125	650
300	490	280	520
375	425	410	400
405	350	75	625
240	625	60	675
500	60	300	300
305	375	100	700
150	625	40	650
305	400	410	425
75	625	50	825



Questions:

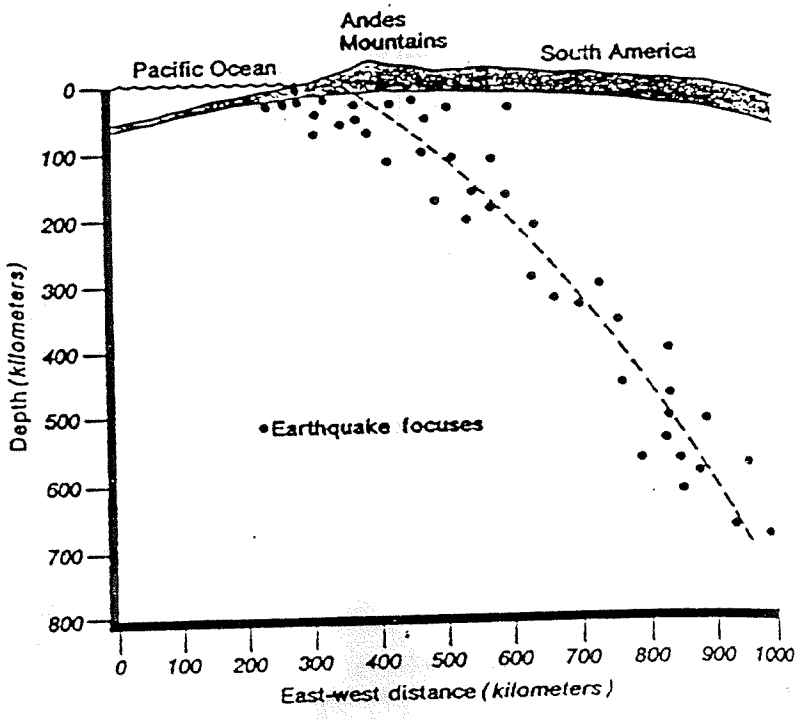
1. Describe the pattern of the focii.

2. Which focii are most likely to cause damage to cities? Explain your answer.

3. Suggest a reason for the pattern of focii. What must be happening in this region of the Earth?

4. Are all of the focii in the lithosphere? What questions does this raise about tha interior of the Earth?

5. The diagram below represents the earthquake focii under South America. Compare this pattern to the one you just plotted. Compare in terms of: direction, angle, curvature, land forms, etc.



The focuses of earthquakes under South America seem to trace out a line.